Economic Trends in the U.S. Pecan Market with an Overview of The U.S. and World Tree Nut Complex

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Abstract: The United States is the world leader in production and exports of tree nuts. Pecans are a major tree nut commodity in U.S. markets, accounting for one-fourth of the U.S. tree nut diet. Total use, domestic consumption, and exports increased 8 percent from the 1980's to the 1990's. Acreage and production are expected to trend upward in the coming years. Imports from Mexico have continued to climb and have boosted total supply and stock levels. Imports are about one-fourth the size of the U.S. crop. Unlike other tree nuts, pecan exports have experienced slow growth and are a minor share of supply. The value of the U.S. pecan crop and grower prices have risen moderately.

Keywords: Tree nuts, pecans, production, supply, imports, demand, prices.

The Nature and Importance of Pecans in American Agriculture

The pecan is the only tree nut native to North America. It is produced commercially in 14 southern States from the West Coast to the East Coast. The United States is the world's largest producer of pecans, with an estimated 75 percent of the total, followed by Mexico, with about 20 percent, and the remaining 5 percent are from small commercial plantings in several countries such as South Africa, Australia, and Israel. Pecans account for about one-fourth of U.S. total tree nut consumption. About 21,000 farms grow pecans worth $250 million annually. Most pecan growers are part-time and many grow other crops, such as cotton, peaches, and peanuts, or raise livestock for income diversification.

Recent World Production and Export Trends For Tree Nuts

World tree nut production for the 1997/98 marketing year is estimated at 5.32 million metric tons, about 5 percent higher than the previous marketing season.[2] World production and exports of tree nuts have trended up since 1989, but exports are still only 16 percent of production (figure A-1). In many countries, the majority of tree nut production is consumed within the country where it is produced. In the case of the United States, about two-thirds of its total tree nut production is exported. Although pecan exports are growing, the quantity exported is still less than 20 percent of U.S. production.

The United States is the world's leading producer of tree nuts and commands about 18 percent of the total, followed by Turkey (14 percent), China and Iran (each 8 percent), and Spain and Italy (each 5 percent), all other countries account for about 41 percent (figures A-2 and A-3). The U.S. share of world tree nut supply grew in 1997, with large crops of almonds, pistachios, hazelnuts, and walnuts. Likewise, moderate increases were noted for U.S. production of macadamias and pecans last season. The largest crop in world tree nut supply is almonds, with about 23 percent of the total, followed by walnuts (20 percent), cashews (16 percent), hazelnuts (13 percent), chestnuts (10 percent), pistachios (8 percent), and all others about 10 percent (figure A-4). Pecans account for 4-to-5 percent of the total. Most of the world's almonds and pecans come from the United States, and the United States also produces a substantial share of the world's walnuts, pistachios, and macadamias.

The Major Tree Nut Markets in the World And Which Tree Nuts Dominate

Although India leads as the world's largest importer of tree nuts with nearly 15 percent of the total, Europe remains as the more traditional market for U.S. tree nuts (figure A-5). Germany is the most important European market, with 12 percent of the world's total imports of tree nuts. Other important markets in Europe include Spain, France, the United Kingdom, Belgium, and the Netherlands. Major markets in Asia include Japan with 10 percent of the world total and Hong Kong with 6 percent. Other significant markets include Singapore, Taiwan, and Korea. China has increased its market share and could rapidly become a substantial consumer market. The United States itself is a major importer of tree nuts, with 7 percent of the world total.

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Other important world markets include United Arab Emirates, Syria, Canada, and Russia—the latter is quickly becoming a major buyer.

In 1995, hazelnuts were the most important tree nut commodity, in terms of quantity, traded in world markets with 30 percent of the total (figure A-6). This was followed by almonds (23 percent), cashews (16 percent), walnuts (12 percent), chestnuts (5 percent), pistachios (4 percent), and Brazil nuts (1 percent), and the remaining 9 percent were "all other" tree nuts. The all other tree nut category includes pecans, pignolias or pine nuts, macadamias, kola nuts, and areca nuts. Pecans comprise about 5 percent of total world tree nut imports.

The United States exports pecans primarily to Canada, Mexico, and Europe; however, some of the exports to Mexico are shipments to *maquiladoras* which shell-out pecans and re-export to the United States. Mexico exports its pecan production principally to the United States and Canada, but it is also expanding exports to Europe and South America.

Trends in U.S. Pecan Production, Supply, Consumption, and Imports

U.S. pecan production climbed moderately during the late 1970's and early 1980's, peaking in the mid-80's, then declined during the late 1980's and early 1990's. Pecan production is now experiencing somewhat of a resurgence since the mid-90's due to plantings in the 1980's. New bearing acreage partly explains this phenomenon as yields increase. Total pecan acreage expanded about 4 percent between 1987 and 1992, with the number of bearing-age trees increasing 11 percent. Nearly all of this increase occurred in the Southwest and for improved pecan varieties. There have been steady declines in the population of native pecan trees and a slight decline in acreage in the Southeast. It is expected that these trends have continued since 1992, but more recent data on farm numbers, acreage, and tree numbers are unavailable until publication of the 1997 *Census of Agriculture*.

U.S. pecan imports were mostly insignificant during the 1970's, rose moderately during the 1980's, and then rose substantially during the 1990's (figure A-7). Imports are now about one-fourth of U.S. pecan production. Generally, pecan supply and consumption have tracked very similar curvilinear trends over the past 20 years; however, during the mid-1990's there appears to be a departure from the normal consumption/supply relationship (figure A-8). Perhaps one explanation for this phenomenon is the substitution of pecans by cereal manufacturers and other industry users for lower priced tree nuts whenever pecan quality is low and/or prices are high.

Economic Implications of Pecan Supply and Demand on Grower Prices

Total U.S. pecan *supply* (production+imports+beginning stocks) has had a strong upward trend over the past 20 years, and this has been especially true in the most recent 5 years (figure A-9). Pecan supply has outpaced pecan *use or demand* (domestic consumption+exports) which has gradually resulted in higher stock levels. This change has occurred in spite of a general downward trend in production. Pecan use in the 1990's has averaged 135 million pounds, shelled basis, or about 8 percent higher than the 1980's. In comparison during the same time period, walnut use has jumped 20 percent, mostly due to higher exports.

It is notable that pecan grower *prices* (season average of all sales) have trended upward modestly while pecan use has made stronger gains (figure A-10). Prices are nearly flat for the period prior to 1990 and also for the period after 1990. However, prior to 1990 prices were significantly lower, but also more stable. This fact may indicate that a more uncertain supply/price situation has occurred since 1990, perhaps shellers bidding up prices, more open market sales, and direct marketing, or other economic factors influencing market conditions.

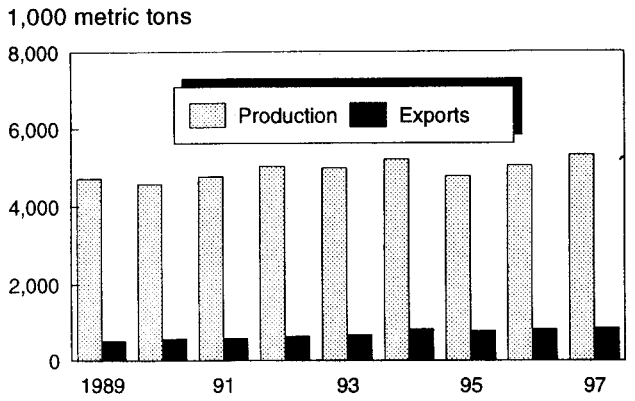
Statistically, pecan prices regressed on pecan supply have a low correlation coefficient or, in other words, supply explains only a part of the year-to-year variation in prices. Pecan growers must sell their crops in a short time period (September-December) in an "oligopsonistic" market where there are relatively few buyers involved. If shellers invested heavily in the previous crop or "cost of goods inventory," they will have less propensity to invest heavily in the current crop, even though it may be smaller in size and of higher quality. However, other economic factors will impact price determinations such as size of the Mexican pecan crop, current availability of improved vs. native pecans, stocks, and supplies and prices of competing tree nuts, especially California almonds and walnuts.

Trends in pecan and walnut grower prices have been very similar with the recent exceptions of 1993 and 1996, when shelled walnut prices were significantly higher than pecans (figure A-11). This shift was primarily the result of low quality pecans that reduced grower prices. The 1991 crop was a record high combined with below-average quality, but the low prices in 1996 occurred when a small crop was produced, also with quality problems.

The 1994 walnut crop quality was poor due to extensive sunburn damage which caused prices to fall substantially; however, prices were high for the relatively small available supply of light halves, the highest quality product-type demanded by the trade. Since 1995, walnut prices have improved and been more stable. The short supply of quality walnuts bolstered pecan prices in 1994 and helped to stabilize prices again in 1995. Similar quality problems occurred with pecans in 1993 when a significant portion of the crop, especially in the Southwest, was heat damaged, causing shriveled kernels. The lower quality pecans not only adversely impacted prices, but yielded much lower kernel

World Tree Nuts

Figure A-1
World Tree Nut Production and Exports 1/



1/ 1996 and 1997 exports estimated.

Figure A-2
World Tree Nut Production by Country, 1997

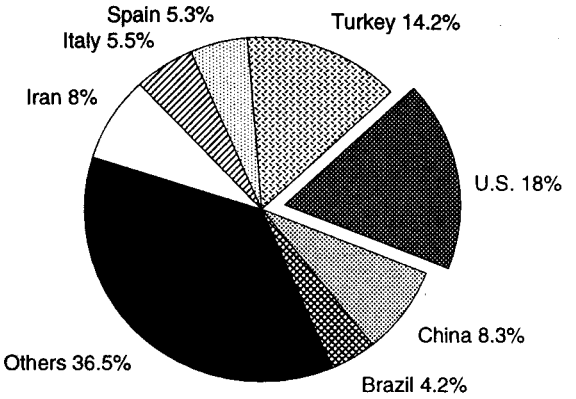


Figure A-3
World Tree Nut Production by Country, 1996

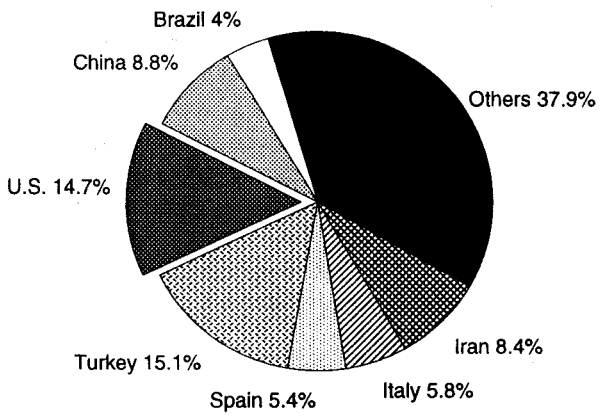


Figure A-4
World Tree Nut Production, 1996

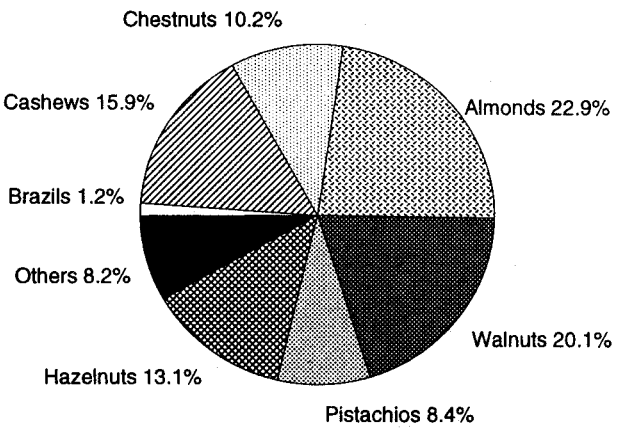
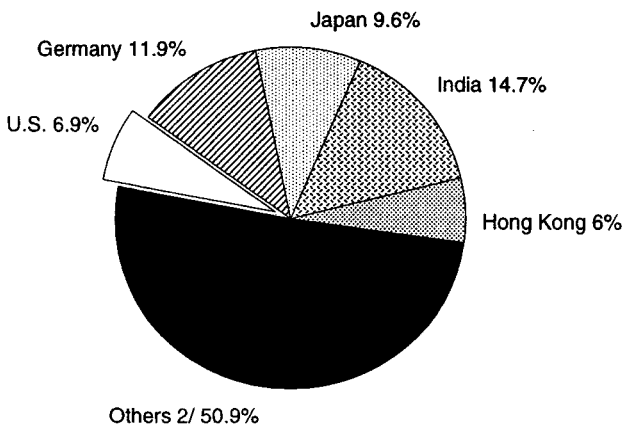
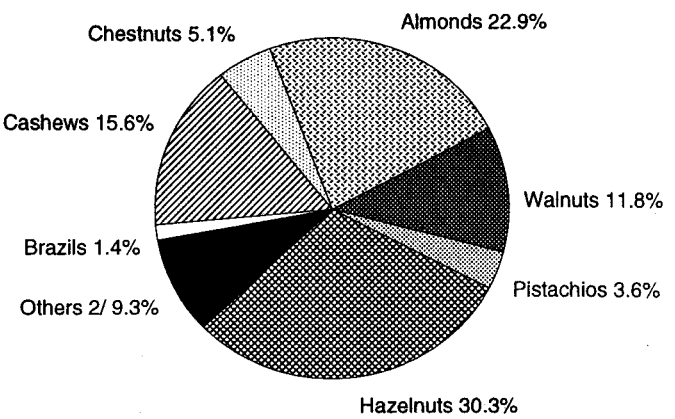


Figure A-5
World Tree Nut Imports by Country, 1995 1/



1/ Based upon import value. 2/ Majors are Western Europe, Canada, Singapore, Russia, United Arab Emirates.

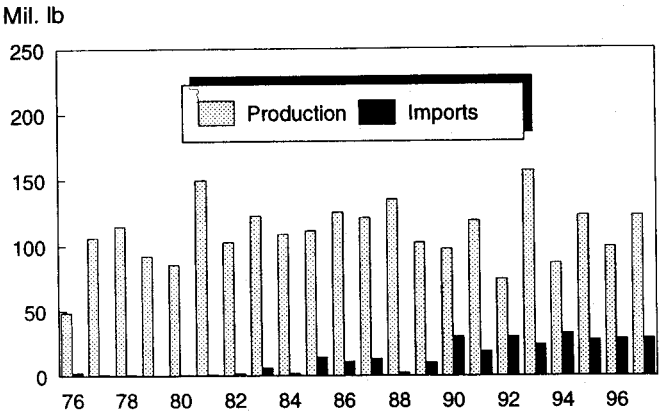
Figure A-6
World Tree Nut Imports, 1995 1/



1/ Based upon quantity.
2/ Pecans, pignolias, Macadamias, kola nuts, areca nuts.

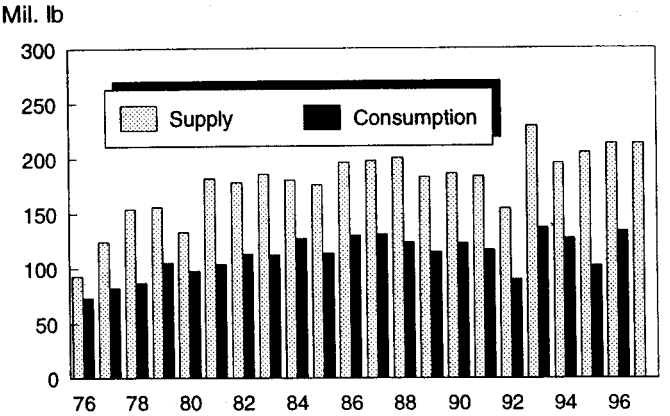
U.S. Pecans

Figure A-7
U.S. Pecan Production vs Imports



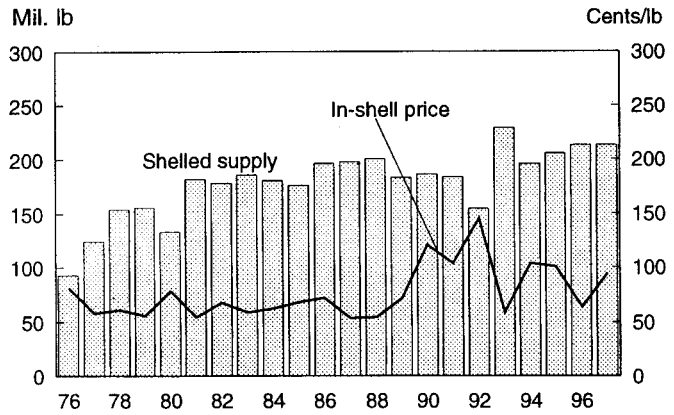
Shelled basis.

Figure A-8
U.S. All Pecan Supply and Consumption



Shelled basis.

Figure A-9
U.S. All Pecan Supply and Grower Price



1/ 1996 and 1997 exports estimated.

Figure A-10
U.S. Pecan Use and Grower Price

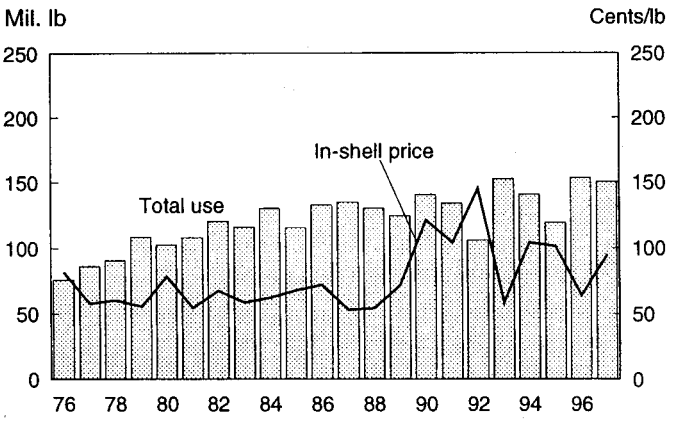


Figure A-11
U.S. Pecan and Walnut Grower Shelled Prices

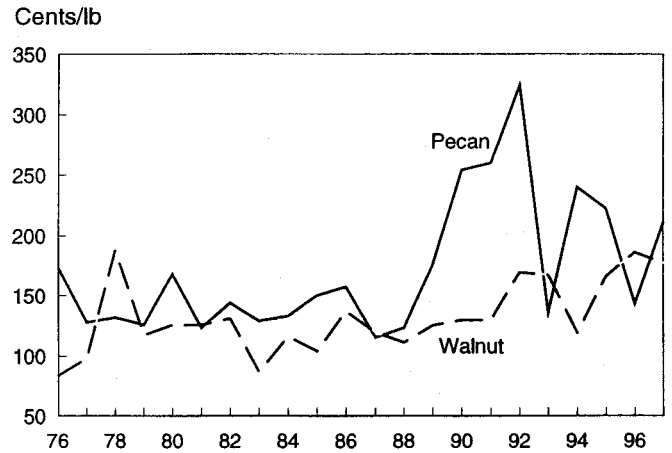
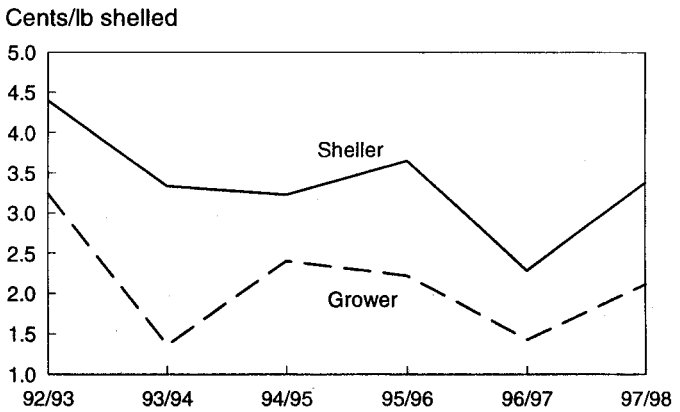


Figure A-12
U.S. Pecan Sheller Wholesale vs. Grower Prices



Sheller quotes (Oct.-Dec.) fancy f.o.b. Southwest.

shell-out and pounds harvested, reducing grower revenue even further. However, prices were excellent for good quality, fancy-grade pecans, when and where available.

Again in 1996, crop production, quality, and prices were adversely impacted. Lower demand resulted because users did not want the low-quality product nor did they want to pay high prices for a limited supply of the high-quality product. Imports increased because there was not sufficient quantity of high-quality domestic product. Pecan use or demand then can be dampened whenever there is disparity in domestic product quality, availability, and price, and imports are likely to increase to fill the void in supply.

Figure A-12 compares some sheller wholesale and grower prices for the past 6 years. The sheller prices are mid-points of price range quotes, f.o.b. fancy-grade pecans, Southwest, during October, November, and December when most of the crop is sold. The grower prices are season average prices for all sales; however, again most of the crop is sold during the fall months. It is apparent that sheller/grower price margins can increase or decrease year-to-year depending on supply, crop quality, and other economic factors. A further review of sheller wholesale prices over the past three seasons, reveals that prices vary considerably within a season as well as year-to-year (figure A-13).

Pecan production has actually trended lower and has been more than offset with higher imports, but is now resurging to levels experienced in the mid-1980's. Also, since total use or "apparent disappearance" has not kept pace with an upward trend in supply spurred by imports, ever higher stock levels can be a continuing problem for growers and shellers. Industry experts indicate that a major cause for this long-term production decline is due to lower yields rather than tree numbers. Average yield levels for mature improved groves have in many cases reportedly dropped from historical or typical levels of 1,000-1,200 pounds per acre to 800-900 pounds. A reason for the general yield decline could be a shift in the age structure of the trees. Trees planted in the 1980's are just now beginning to bear significant commercial quantities, and yields will continue to increase with maturity.

Anecdotal data and interpretation of information about pecan growers, many of whom are part-time, indicate that many growers may not be expending the necessary inputs (chemicals, fertilizers, water, etc.) to maintain yields at higher levels, rather, they are perhaps opting to attempt to cut costs to maintain profit margins. These cost-cutting decisions can result in short-term and long-term effects. Not only does it appear that this general cutback in production inputs may be affecting current crop yield and production levels in terms of pounds per acre and meat yields, but the long term viability and vigor of the trees may be affected. Also, implied is that if prices and returns are not sufficient to maintain adequate input levels then they are also not sufficient to replace lost trees and plant new acreage.

Another reason for the long-term production decline is the removal or loss of older trees to urban development, wind damage, drought, disease, abandonment, or other causes. Some of the trees have been replaced or replanted with newer, higher yielding cultivars, but these trees have not yet matured to their peak yield potential.

Effects of Pecan Production On Pecan Grower Prices

Increases or decreases in pecan production can inversely affect prices; however, supply is altered not only by changes in production, but also stocks and imports. Pecan crop quality is also an over-riding price factor. In 1996, pecan production was down for mostly weather-related causes and there were significant quality problems. Record high stocks carried over from the previous season and imports more than offset the smaller new crop. Like pecans in 1996, most tree nut commodities experienced an "off-year" in the production cycle. The California walnut crop was down substantially and the reduced total supply pushed grower prices there to record highs. Pecan prices should have strengthened, but, conversely, pecan prices fell sharply.

Since we know there is some *complementarity* as well as some *substitutability* among pecans, walnuts, and almonds, it appears that competing nut supplies/prices may be only a limited factor in pecan prices as prices for the different crops moved in opposite directions. Manufacturers in many instances base their purchase decisions on quality more so than price and are willing to pay higher prices for commodity x (say walnuts) for excellent quality, even if commodity y (say pecans) prices are much lower and quality problems exist. Therefore, both supply and crop quality appear to be significant price-determining factors.

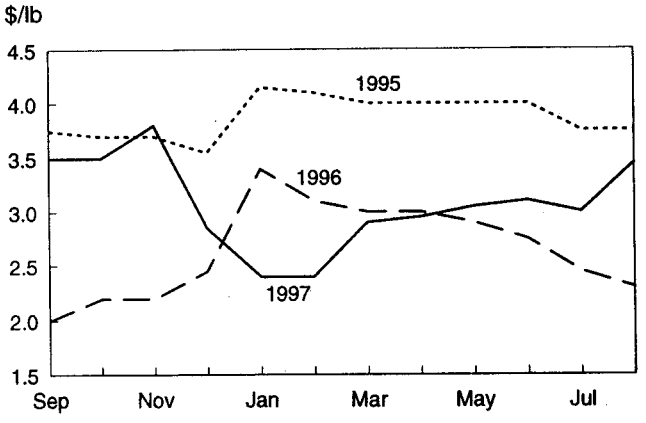
The pecan supply and price situation for the 1997/98 season is very similar to the situation in 1995/96. However, prices this season are reportedly a little lower, owing to several factors including the record U.S. walnut crop and lower prices. The large walnut crop will likely boost walnut exports, but only modestly since world supplies are very high due primarily to another record harvest in China. This situation will likely cause a build-up in U.S. walnut stocks since domestic use is not expected to absorb the additional supply. Likewise, there could be a rise in ending pecan stocks if domestic use does not increase from last season.

Interaction Between Improved vs. Native Pecan Supplies/Prices

Production of native and seedling pecans is more erratic than improved pecans, mostly due to a more accentuated cyclical nature, but also partly due to geographic concentration, less irrigation, and lower management intensity, and the inherent, inferior biological characteristics of native and seedling trees (figure A-14). Often native pecan prices are fairly inelastic to changes in supply, but close examination

U.S. Pecans

Figure A-13
U.S. Sheller Wholesale Seasonal Prices



F.o.b. fancy Southwest.

Figure A-14
U.S. Native Pecan Production and Price

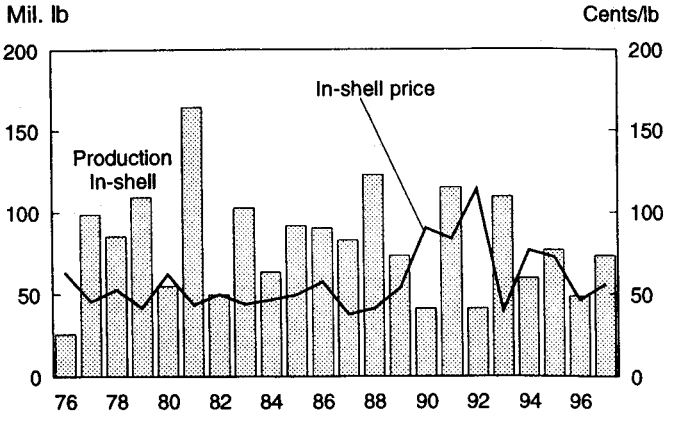


Figure A-15
U.S. Improved Pecan Production and Price

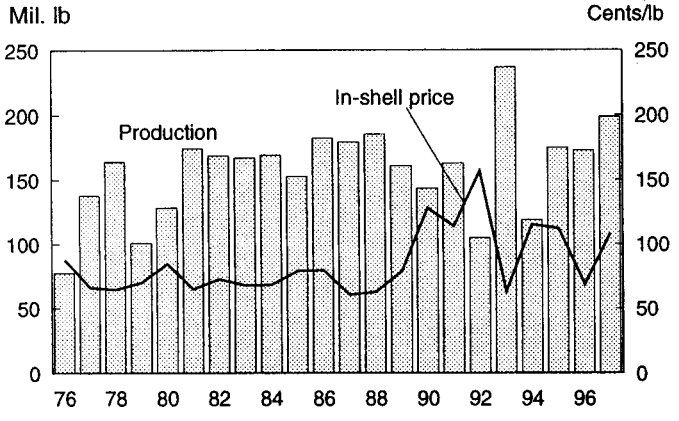
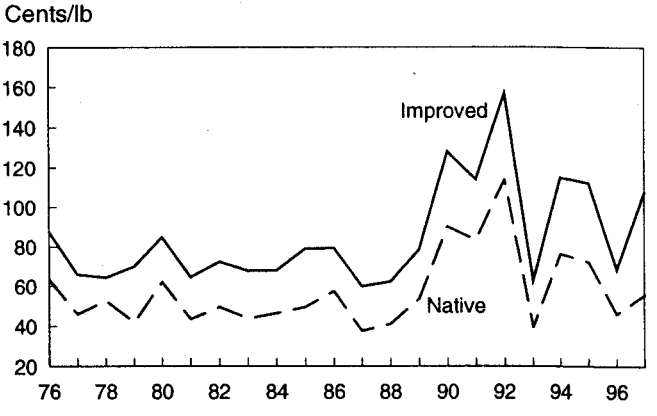


Figure A-16
U.S. Pecan Grower In-shell Prices



of the data reveals that native prices are highly correlated to improved pecan prices and are much less dependent on the native pecan supply (figure A-15). In fact, the trend in native prices is nearly in perfect parallel to the trend in improved pecan prices. Native and seedling prices are typically established at a basis 25-30 percent below improved pecan prices to reflect the difference in processing costs. Shelling ratios are much lower for native and seedling pecans; thus, a "higher count" of pecans is required to yield a pound of nut meats, which results in higher shelling costs.

Since the native price is a direct function of the improved price, almost 1:1, where an increase or decrease in the price for improved pecans result in a proportional increase or decrease in the price for native pecans; i.e., the native price is virtually always within a fixed-range or margin below the improved price (figure A-16). Therefore, the native pecan price can be predicted from the improved pecan price with a high degree of statistical reliability. Since the price for natives is a function of the improved price and not the supply of natives, one should attempt to forecast initially the improved price, then the native price, and then the combined overall price. Grower gross crop cash receipts are the sum of the improved pecan receipts plus the native pecan receipts.

Future Perspectives for the U.S. Pecan Industry

Pecan prices are likely to remain weak unless domestic and international demand rises significantly to boost pecan use to much higher levels. With the development of new products and markets, the pecan industry could enhance sheller and grower price and profit positions and greater total returns that can be used to re-invest in improving production capabilities, efficiencies, and better long-run industry viability.